



DNR 2017 CAFO Workshops

RUNOFF CONTROL FOR CAFOS

CAFO PRODUCTION AREA REQUIREMENTS FOR SURFACE WATER PROTECTION

- ✗ CAFO regulations don't allow discharges of pollutants to navigable waters except under the following circumstances.
- ✗ The discharge must be the result of a precipitation overflow of a properly operated storage facility designed to contain up to the 25-year storm.

RECENT DEVELOPMENTS

- ✗ DNR “Calf Hutch Lots” letter
- ✗ Draft DNR “Feed Storage Runoff Controls for CAFOs” guidance
- ✗ NRCS 635 VTA Standard requiring a no discharge system for CAFOs
- ✗ These are responses to new knowledge that VTAs and Calf Hutch areas often did not meet CAFO requirements

FEED STORAGE VTA GRAB SAMPLES

Name	Discharge Phos. Conc. (mg/l)	Inlet Phos. Conc. (mg/l)	24-hr Rainfall Depth	Date	VTA to Drainage Area Ratio	First Flush Collection
OU1	22.06	45.3	0.55"	6/12/ 15	100%	0.05"
BR1	3.12	NA	0.43"	4/24/ 15	35%	0.2"
BR2	10.1	NA	0.43"	4/24/ 15	13%	uncertain
BR3	2.08	NA	0.43"	4/25/ 15	10%	0.05"
CRP	0.6	Preliminary average concentration at field edge				

RUNOFF CONTROLS IMPLEMENTATION

- ✗ New feedpad and animal lot designs require a no discharge runoff management system.
- ✗ New VTA designs must follow the new NRCS 635 Standard.
- ✗ Existing CAFOs will need permanent, no discharge systems
- ✗ If discharges are occurring, the CAFO permit requires interim measures immediately to control the discharge.

RUNOFF INSPECTIONS

- ✘ Inspect feed storage areas, animal lots, and VTAs.
- ✘ Note proximity to surface waters and concentrated flow paths. Walk the flow path during wet weather conditions and document.
- ✘ If there is a possible flow path it is likely there is a discharge to navigable waters during the 25-year storm.



DISCHARGE END OF VTA AFTER RAIN



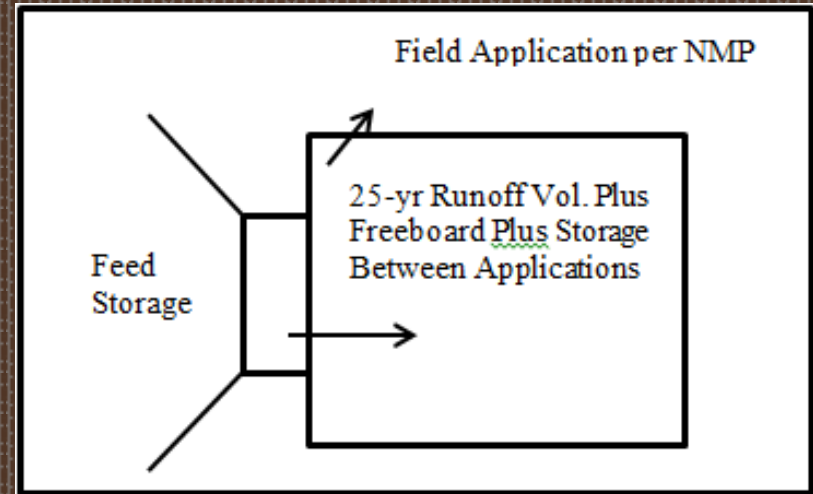
“NO DISCHARGE” DESIGN CONCEPTS

- ✗ Full Collection
- ✗ VTA with NMP and Sunny Day Release
- ✗ Infiltration Basin
- ✗ Infiltration VTA with End Collection System
- ✗ Fully Covered Feed Storage
- ✗ Other concepts may also be possible



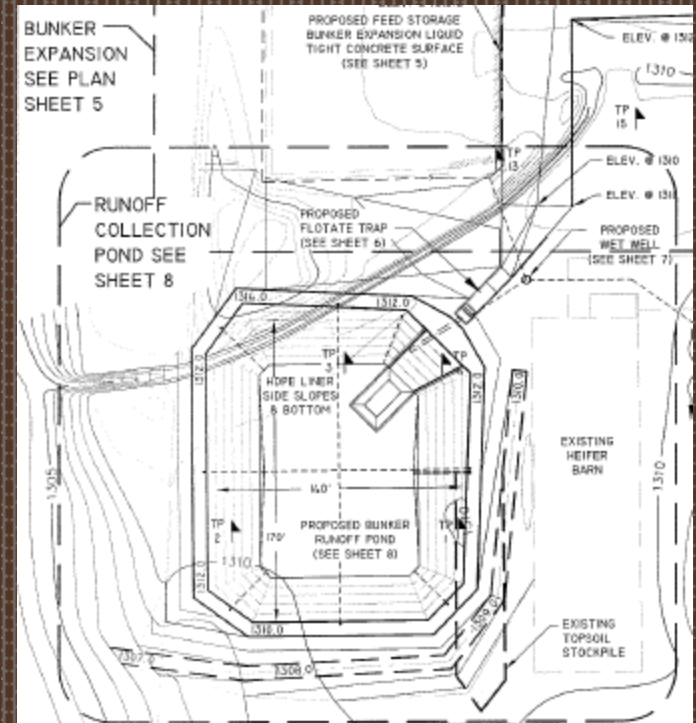
FULL COLLECTION TO STORAGE

- ✘ Collect flow up to 25-year storm
- ✘ If no manure then 180 day storage doesn't apply but still need to meet NMP requirement
- ✘ Design is subject to NR 213 & NRCS 313



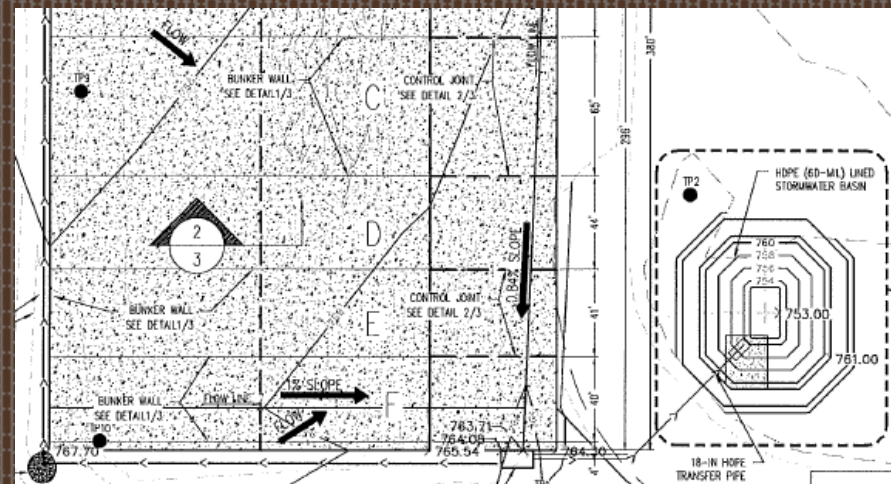
RUNOFF STORAGE EXAMPLE

- ✖ Gravity flow of 25-year storm.
- ✖ 180 days storage with HDPE liner
- ✖ First flush collection to manure lagoon.



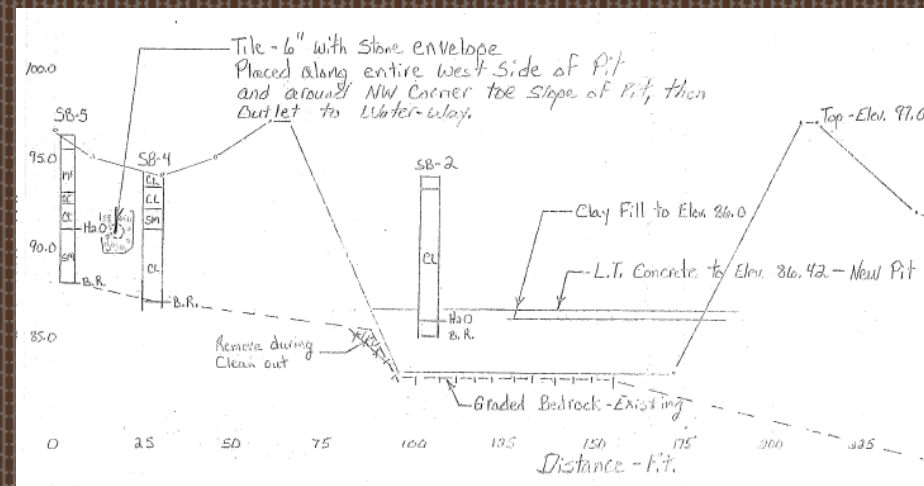
HOLDING POND EXAMPLE

- ✗ Gravity flow of the 25-year storm to the HDPE pond.
- ✗ Pond has capacity for 25-year runoff volume.
- ✗ Pond immediately pumped to manure storage.



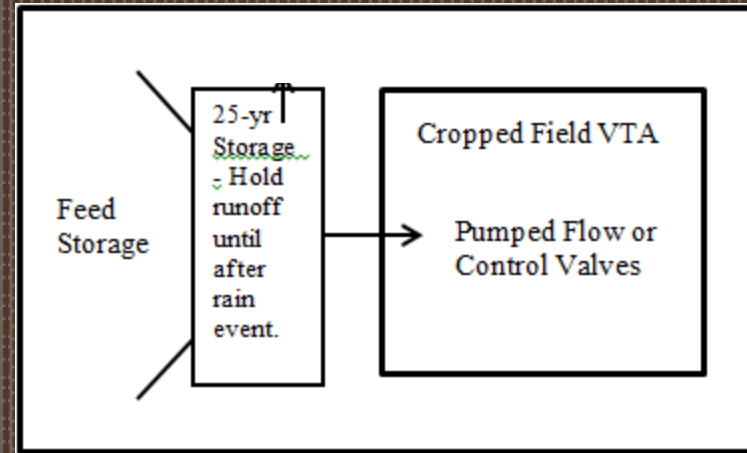
RUNOFF STORAGE RETROFIT CONCERNS

- ✗ Unknown if NR 213 5-ft separation is met.
- ✗ In-place-earth liner on side slopes not compliant with NR 213.
- ✗ Question over perched vs. regional groundwater
- ✗ Draintile may be set too high.
- ✗ Relies on daily field spraying.



VTA/SUNNY DAY RELEASE SYSTEM

- ✘ VTA would be managed for nutrient inputs/output. Monitor nutrient application and soil samples.
- ✘ Requires a temporary storage. Runoff cannot be discharged onto VTA during rain events, when soil is saturated, or in the non-growing period.
- ✘ Infiltration past root zone and discharge from the end is not allowed.

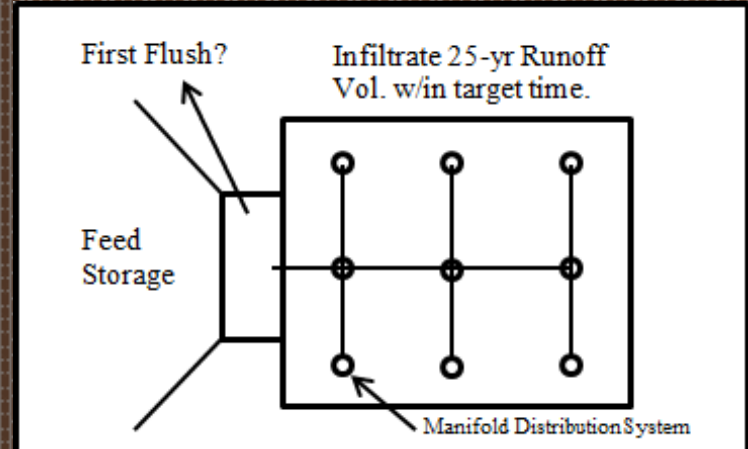


CURRENT NRCS 635 VTA STANDARD

- ✗ Size VTA to balance 25-year runoff volume and nutrients.
- ✗ Runoff water balance occurs in root zone and should not infiltrate to groundwater or discharge off end.
- ✗ Balance nutrients from waste runoff with nutrient uptake in harvested vegetation.
- ✗ Apply waste runoff only when the soils are not saturated.
- ✗ Apply waste runoff only during growing season.
- ✗ Use a sprinkler irrigation or other means to ensure uniform application or runoff.

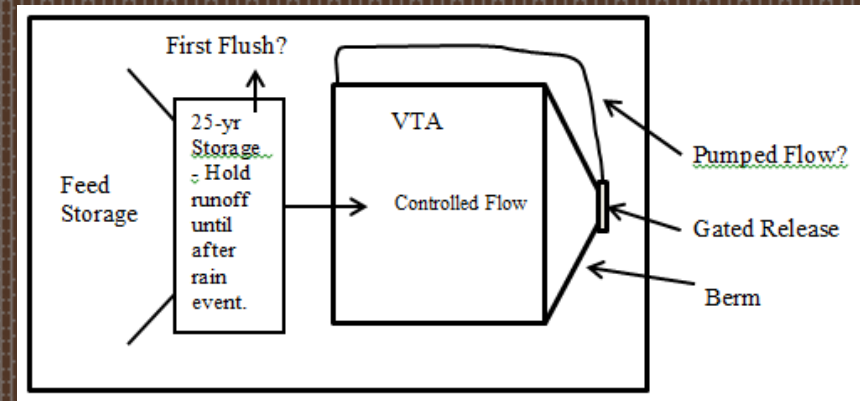
INFILTRATION BASIN

- ✘ Infiltration basin sized to contain runoff from the feed pad and direct precipitation up to the 25-yr storm.
- ✘ Collection of the first inch of runoff to minimize groundwater pollutant loading.
- ✘ Size the basin for a target drawdown time of 72 hrs based upon the infiltration capacity of the soils (DNR 1002 or measured).
- ✘ Groundwater monitoring may be required.



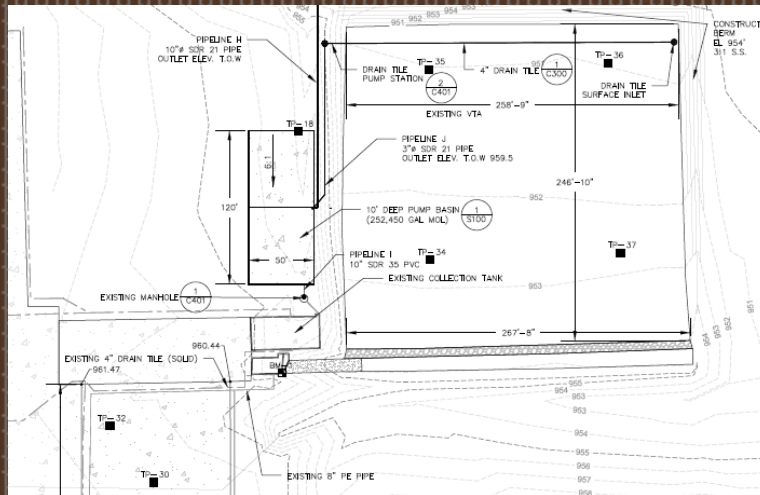
INFILTRATION VTA WITH END COLLECTION SYSTEM

- ✘ VTA and pumped recirculation system sized to accommodate the 25-year peak flow.
- ✘ Collection of the first inch of runoff to minimize groundwater pollutant loading.
- ✘ Size the basin for a target drawdown time of 72 hrs based upon the dynamic infiltration capacity of the soils (DNR 1002 or measured).
- ✘ Groundwater monitoring may be required.



PILOT VTA RETROFIT EXAMPLE

- ✘ Temporary collection of the first 2.49" of runoff in a pumping basin and from there to a waste storage.
- ✘ A berm, pump station and draintile at the end of the VTA will trap runoff up to the 25-yr storm.
- ✘ Trapped runoff will be pumped every 3 days to the pumping basin and then to waste storage.
- ✘ One-year approval with measure - ment of runoff concentrations and then long term options will be assessed.



FULLY COVERED FEED STORAGE

- ✗ Cover feed storage area so rainfall cannot contact stored feed, working face and spilled feed.
- ✗ Non-rainfall related leachate collection still required.
- ✗ Feasible with large roof?



HAYLAGE IN BAGS AS FULLY COVERED

- ✗ Haylage has the same restrictions on pollutant discharges as corn silage.
- ✗ Theoretically possible to store haylage without collection on very well managed feed pads with proper drainage or silage bags.
- ✗ Bunker walls would be problematic due to runoff running down walls.
- ✗ Low leachate production in haylage needs to be demonstrated.
- ✗ Wet weather sampling may be needed. DNR approvals would be case by case and site specific.

QUESTIONS?

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